

## CLAIMS

1. A current direction detection circuit for detecting flow of current in the reverse direction in an earth side output transistor, through which current flows from an earthed input terminal to an output terminal, comprising:

a monitoring transistor having a control terminal and an output terminal respectively connected with a control terminal and an output terminal of the earth side output transistor;

an impedance element having one terminal connected with the input terminal of the monitoring transistor and the other terminal earthed;

first and second constant-current sources;

a diode-connected reference transistor interposed between the first constant-current source and earth potential; and

a sensing transistor, interposed between the second constant-current source and the impedance element, having a control terminal connected with a control terminal of the reference transistor, wherein

the voltage between the second constant-current source and sensing transistor is output as a control signal to

control the earth side output transistor and monitoring transistor.

2. A switching regulator comprising:

a power source side output transistor and a earth side output transistor provided in series between an input power source and earth potential;

a smoothing circuit having an input terminal connected between the power source side output transistor and the earth side output transistor and an output terminal connected with a switching regulator output terminal that outputs a predetermined DC voltage;

a regulator control circuit that performs on/off control of the power source side output transistor and earth side output transistor so as to maintain a predetermined DC voltage by inputting as feedback the voltage of the switching regulator output terminal;

the current direction detection circuit according to claim 1; and

an earth side output transistor control circuit that controls the earth side output transistor so as to maintain the same continually turned off once the control signal of

the current direction detection circuit has risen, after being turned on by the control signal of the regulator control circuit.